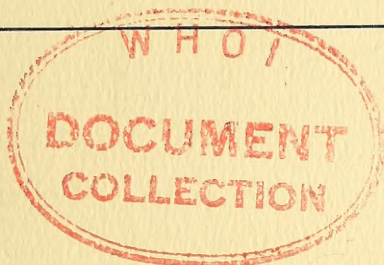


MAY 1969

MP407



USES OF THE SEAS

Background Report

prepared by
William H. Matthews

NEW ENGLAND
ASSEMBLY

May 1969



Woods Hole Oceanographic Institution



The American Assembly · COLUMBIA UNIVERSITY

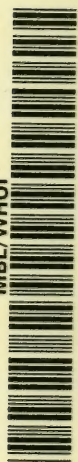
GC
11
.m38

C. 2



DEMCO

MBL/WHOI



0 0301 0040002 4

Background Report

New England

Assembly

Prepared by

William H. Matthews

May 1969

TABLE OF CONTENTS

	Page
THE UNITED NATIONS	3
Summary	3
Early Activities	3
The Malta Proposal	4
Ad Hoc Committee on the Sea-Bed	9
Resolutions Adopted by the General Assembly	14
REPORT OF THE COMMISSION ON MARINE SCIENCE, ENGINEERING AND RESOURCES	18
Summary	18
The Proposed National Oceanic and Atmospheric Agency	18
Recommendations on International Agreements	22
Additional Commission Recommendations	24
POLLUTION OF THE SEA	27
The United Nations	27
The United States	30
PROGRAMS OF THE U. S. NAVY	34
ADDITIONAL DEVELOPMENTS IN 1968 AND 1969	37
Support of U. S. Oceanography Programs	37
International Decade of Ocean Exploration	37
Educational Programs	37
Proposed Council of Maritime States	38
Great Lakes Study	38
U. S. Research Halted by Brazil	38
Oceanography in Other Countries	39
Proposed Oil Supertanker Ports in New England	39

THE UNITED NATIONS

Summary

The United Nations has been involved in many oceanography programs over the past decade, but until recently its primary concerns have been the coordination of international programs and the advancement of scientific research. In 1967, the island of Malta proposed that the U. N. assume jurisdiction of the ocean floor and ensure that it be used for peaceful purposes in the interests of all mankind. This action provided the catalyst for concentrated thought about the future of the sea-bed in the U. N. and in many countries of the world.

In response to this challenge, the General Assembly created an Ad Hoc Committee to study the scope and various aspects of exploration, exploitation, and use of the sea-bed and ocean floor. Meeting throughout the spring and summer of 1968, the Ad Hoc Committee identified and discussed the major problems which the U. N. and its Member States would face in the years ahead. The group supplied the twenty-third session of the General Assembly with a list of principles upon which unanimous agreement had been reached. Using these as a guide, the General Assembly adopted a number of resolutions in December 1968 including one which established a permanent Committee on the Peaceful Uses of the Sea-Bed and the Ocean Floor Beyond the Limits of National Jurisdiction composed of forty-two member states.

This United Nations section contains a discussion of the Malta proposal, some reactions to it, the findings of the Ad Hoc Committee, the nature of the new Committee, and the resolutions recently adopted by the General Assembly.

Early Activities

Recognizing the need for greater knowledge of the oceans and the opportunities available in the future, the General Assembly passed Resolution 2172 (XXI) in December, 1966. This requested that the Secretary-General, in cooperation with several U. N. agencies, conduct a comprehensive survey of the activities in marine science and technology being undertaken by international and national organizations. This effort would supplement a survey of the present state of knowledge of the resources of the sea beyond the continental shelf and of the techniques available for exploitation which had been requested by the Economic and Social Council Resolution 1112 (XL) a few months earlier.

In order to assist the Secretary-General, the establishment of a small group of experts was suggested whose members would be selected from the specialized agencies and intergovernmental organizations. The resolution also requested formu-

lation of proposals for ensuring the most effective arrangements for an expanded program of international cooperation to assist in a better understanding of the marine environment, and for initiating and strengthening marine education and training programs.

The report of the Secretary-General containing the survey and proposals was submitted through the Economic and Social Council to the General Assembly in April, 1968. The Ad Hoc Committee on the Sea-Bed which had been formed during the time which the report was being prepared was able to make extensive use of the information contained in it.

The Malta Proposal

In the summer of 1967, the Permanent Mission of Malta to the U. N. proposed that the agenda of the next General Assembly convening in September include an item regarding a treaty on the ocean floor and its resources. Ambassador Pardo thus forced the U. N. and its participating members to begin considering the political and defense aspects being raised by rapidly advancing technology in the field of oceanography.

The proposal suggested that the treaty assure that the seabed and the ocean floor, underlying the seas beyond the limits of present national jurisdiction, are not subject to national appropriation; will be exploited in a manner consistent to the U. N. Charter; will be used in the interests of mankind and to promote the development of poor countries; and will be reserved exclusively for peaceful purposes. In order to carry out these principles, an international agency was proposed to assume jurisdiction over the sea-bed; to regulate, supervise, and control all activities; and to ensure compliance to provisions of the treaty.

Out of the possible regimes for the ocean floor, Malta chose a sophisticated form of international control in order to force a confrontation of the issues facing the international community. Other alternatives include "wait and see," national lake — following the 1958 Convention on the Continental Shelf, flag nation, and other types of international control. A discussion of these issues can be found in the American Assembly publication, *Uses of the Seas*, in Professor Henkin's chapter.

United States Reaction

It is worthwhile to examine the reaction to the Malta proposal of several groups in the U. S. in order to gain insight into their possible positions on future proposals for international agreement.

Congress. Many members of Congress reacted swiftly to what they may have perceived as the imminent yielding of the sea-bed to the U. N. for eternity. Almost two dozen resolu-

tions were introduced in the House during August and September expressing great opposition to the vesting of control of deep ocean resources in an international body. It was almost November before a lone House resolution endorsed the Malta approach. In the Senate, there was one major resolution opposing the move and two introduced by Senator Pell of Rhode Island which endorsed Malta-like action. Senator Pell also drafted a sample treaty in March 1968 for consideration by the U. N. which proposed a licensing body and an international Sea-Guard (modeled after the Coast Guard) to enforce regulations and maintain peace.

An interim report of the House subcommittee which held hearings on the resolutions was released in December 1967. It concluded that a decision on an international treaty now would be "precipitate, unwise, and possibly injurious" to national objectives. They recommended that the matter should be studied in more detail, that the U. S. actively discourage action toward a final decision at this time, and that the U. S., while continuing to encourage international cooperation, proceed "with the greatest caution." Some members of the subcommittee did, however, believe that the U. N. was the proper assembly for eventual agreement and that the Outer Space treaty provided an impressive precedent.

Both Houses made it clear that the development of oceanography has been and should continue to be particularly associated with Congress. They do not feel that they are offering unsolicited advice and intend to carefully oversee every step of future proposals.

The Department of State. Representatives of the State Department assured Congress that the government had no intention of supporting a Malta-type proposal at *this* time, and that it had made no agreements of any kind which would dispose of the ocean floor. The Department felt that there were too many uncertainties to justify establishing a new international organization.

The Department of Defense. This group advised awaiting the development of technical knowledge before closing any options. They felt that it would be undesirable to prejudice any strategic or military options without enough information to guarantee the security of the U. S. The Navy was concerned that restrictions on territory for peaceful exploitation might restrict the movement of U. S. military vessels.

Other Reactions. Two groups which supported the internationalization of the sea-bed, but not necessarily the Malta proposal, were the editors of the *New York Times* and the Geneva World Peace Through Law Conference. Those who opposed it included the National Oceanography Association, the U. S. Chamber of Commerce, and the American Legion. In 1966, a PSAC

panel pointed out that scientific exploration could be seriously hampered by a premature definition of political jurisdiction.

U. S. Positions at the United Nations

On November 8, 1967, Ambassador Goldberg stated the official position of the U. S. Instead of taking a strictly negative position, he suggested positive alternatives to consideration of the Malta proposal. Stressing the importance of comprehensive and responsible study, he proposed a Committee of the Oceans to serve the General Assembly in considering all proposals and to make recommendations, promote long-term international cooperation, and consider questions of law on exploration, arms control, and pollution.

U. S. S. R. Position

The Soviet Union proposed that the Intergovernmental Oceanographic Commission (IOC) of UNESCO undertake the writing of legal conventions for scientific research and for resource exploitation. The U. S., however, opposed this with the argument that the charter and nature of the Commission were restricted to scientific research and that it would be unable to properly consider the legal problems involved. It was finally agreed that the IOC should establish a working group to study the relationship between scientific research and the law of the sea.

Some U. S. State Department officials and Congressmen interpreted certain Soviet statements at the U. N. as an indication of unwillingness to have the General Assembly become involved, and of extreme reservation on the establishing of a committee to investigate the problems.

Views of Other Countries

About four dozen nations participated in the U. N. debate and views ranged from acceptance of the Malta proposal to reluctance to support any U. N. involvement. Developing countries were sensitive to a new manifestation of the "technology gap." There was no consensus on the major issues or on comprehensive, long range approaches. It was decided that the U. N. should consider the matter further and assume a responsible role in future discussions.

This section contains some of the formal responses to the Malta proposal communicated to the Secretary-General by several countries in early 1968. These positions may have been modified or firmed by the subsequent deliberations of the Ad Hoc Committee on the Sea-Bed to be discussed in the next section, but this will provide some indication of the views regarding internationalization of the sea-bed. The order below reflects the dates of the responses.

Madagascar. This country favored a continental shelf limit of 200 meters and no international jurisdiction beyond those limits although the U. N. might have a supervisory role over certain activities. It supported a percentage distribution of the income obtained from resources to be used for the development of poor countries, and expressed concern about the movement of submarines at great depths and their temporary stationing on the ocean bottom.

Mexico. The Mexican government was concerned with the gap in international law with respect to the legal status of resources of the sea. It wanted to expressly prohibit the installation of nuclear weapons on the ocean floor and to prevent the contamination of the sea-bed with radioactive waste.

Sudan. This country was firmly convinced that the U. N. should take decisive action in determining how to prevent national appropriation of the sea-bed, in regulating the exploitation of resources, in reserving the sea-bed for peaceful purposes, and in aiding the underdeveloped countries.

Turkey. This nation urged revision of the criteria of the 1958 Convention with respect to deletion of the exploitability clause which allows extension beyond a 200 meter depth. It also felt that national jurisdiction over the continental shelf areas should be safeguarded.

United Kingdom of Great Britain and Northern Ireland. This response was restricted to welcoming the proposed survey of past and present activities of international organizations concerning the sea-bed, and to suggesting that it be complemented with a survey of national activities.

Jamaica. Jamaica concurred with the program of study of the Ad Hoc Committee.

South Africa. The South African authorities recommended inclusion of a study of the effects on existing world markets of future exploitation of mineral resources.

Niger. This government approved of the establishment of an Ad Hoc Committee for further study.

Dahomey. This country strongly endorsed internationalization by some means and the use of the resources to advance the peoples of the Third World.

Cuba. Cuba did not transmit their views but reported that they were studying the various aspects of the question.

Sweden. The Swedish government favored some type of international regime for the ocean floor to insure economic exploitation, reservation for peaceful purposes, and control of pollution. Realizing that a solution would not be found for

some time, they suggested that measures be considered to freeze the present situation to avoid future claims.

Netherlands. This government felt that the security aspects should be dealt with by the agencies concerned with arms control and disarmament. They outlined an international system for the ocean floor based on exploitation under the supervision of the United Nations as the agent of the community of nations. They suggested that pending the preparation of this convention that future occupation of the ocean floor be ruled out by a General Assembly resolution.

Belgium. This country favored provisions for the sea-bed similar to those in the Antarctic Treaty, and pointed out the ambiguity of present international law. It was also inclined toward excluding living organisms from new provisions pertaining to the resources of the subsoil. In order to encourage exploitation, the government suggested that exploiting nations be allowed a reasonable profit on any ventures before profits were appropriated for the benefit of mankind.

China. The Chinese government favored internationalization of the sea-bed and offered its cooperation to the U. N. in future exploration and exploitation.

Canada. As a member of the Ad Hoc Committee, Canada stressed the importance of dealing with the legal questions regarding the area of the ocean floor under consideration. They felt that the disarmament and political aspects, while of undeniable importance, would be more appropriately considered at a later time after the legal and technical aspects had been studied in some depth.

Norway. The Norwegian government expressed the urgency which it felt for the need for a thorough examination of the problems involved. The problem of defining the limits of national jurisdiction was seen as particularly acute, yet the government refrained from making any specific proposals. It felt that the Outer Space Treaty provided some guidance for effective and peaceful exploitation of the resources of the sea-bed. The response also warned of possible conflicts of interest between the traditional maritime activities and the future exploitation of the ocean floor. An opinion on the matter of who should benefit by the proceeds of the exploitation was not offered, although hope was expressed that they could be used for the benefit of all mankind.

Saudi Arabia. This country stressed the importance of reserving the right of exploitation even though the country might not be able to exercise the rights at the present time. It suggested that "for the benefit of mankind" be interpreted as the benefit of the coastal State conducting the exploitation which

does not conflict with the benefit of the international community.

Colombia. The Colombian government expressed alarm over the possibility of scientifically and technologically advanced nations unilaterally exploiting immense ocean resources. It strongly endorsed study of an international regime and agreements for the allocation of profits to developing countries.

Denmark. The Danish government stressed the importance of defining the outer limits of national jurisdiction. It proposed an international regime much less structured than the Malta proposal. This regime would not allow extension of sovereignty or non-peaceful uses. The States would inform the Secretary-General of the U. N. of their activities on the ocean floor, and a system might be devised to avoid possible conflicts. Furthermore, there might be some delimitation of the activities which could be undertaken by States, inter-governmental organizations, and by private individuals or companies.

Italy. In addition to the political, legal, economic, scientific, and military aspects, the Italian government suggested that future studies be concerned with protection against pollution, the use of sea flora as food, and the status of enclosed seas vis-a-vis open seas.

Ad Hoc Committee on the Sea-Bed

As a result of the debate on the Malta proposal, the General Assembly established by a unanimous vote the Ad Hoc Committee to Study the Peaceful Uses of the Sea-Bed and the Ocean Floor Beyond the Limits of National Jurisdiction. Thus with the adoption of resolution 2340 (XXII) on December 18, 1967, the U. N. initiated a study group whose report recently resulted in the creation of a permanent Committee.

The Ad Hoc Committee was requested to prepare, in co-operation with the Secretary-General, a study for consideration at the twenty-third session of the General Assembly. The three major items requested were:

1. A survey of the past and present activities of the U. N. and other intergovernmental bodies with regard to the sea-bed.
2. An account of the scientific, technical, economic, legal and other aspects.
3. An indication regarding practical means to promote international cooperation in the exploration, conservation, and use of the sea-bed and its resources.

Composed of representatives of 35 Member States, the Ad Hoc Committee held sessions in March, June, and August of 1968. A working group was established to consider the technical and economic aspects and another was formed to consider

the legal aspects. The whole committee discussed the other matters.

Working within severe constraints imposed by time and diverse national interests and opinions, the Ad Hoc Committee studied various aspects of the items and identified many of the main problems. One of the most useful results of the meetings was the qualitative and quantitative indication of the varying degrees of acceptance of certain specific considerations relating to the exploration, exploitation, and uses of the sea-bed. The development of a scheme for the legal regulation of the ocean floor and the activities of States was not within the charter of the Ad Hoc Committee. It was, however, able to draft a statement of broad principles upon which most nations could agree. Thus the study made a significant contribution toward possible ultimate agreement on positive action by the U. N. General Assembly.

The next three sections outline some of the major work and findings of the Ad Hoc Committee on the three items listed above. These are followed by a section and table of conclusions.

Survey of Past and Present Activities

The Committee collected all previous documents and received additional documentation from the various agencies. It was found necessary to revise some of these in light of issues raised by the Legal Working Group.

Account of Various Aspects

Scientific Aspects. The Chairman of the Intergovernmental Oceanographic Commission (IOC) of UNESCO suggested that the Ad Hoc Committee support a proposal to broaden the basis of IOC in order to enable it to formulate and coordinate the expanded program of oceanic research. It was suggested that the broadening could relate to its structure, program, and field of competence. These suggestions were supported with some reservations.

A proposal was submitted by the Secretary-General for an expanded program of international cooperation to assist in a better understanding of the marine environment through science. This was widely endorsed with the suggestion that other programs be carefully taken into account. There were also some questions about the financial implications of this program.

The U. S. proposal for an International Decade of Ocean Exploration was also discussed. It was emphasized that it was only one element in a U. N. program of ocean research. Participating nations, the IOC, and other agencies will play important roles in determining and organizing exploration projects, and underdeveloped countries will be aided so that they can participate. Freedom of scientific research and exploration will be sought but rights for exploitation will not necessarily be

established. Suggested priorities included study of the geology and geophysics of the ocean floor, improvement of data exchange, and prevention of pollution. The International Decade proposal was widely supported.

Economic and Technical Aspects. This Working Group discussed and reported on the following items:

- extent and distribution of mineral resources
- present and foreseeable development of technology
- profitability and soundness of investments
- possible economic implications on world market and prices
- possible repercussions of exploitation on other uses of the sea
- possibility of benefiting mankind as a whole
- prospects for international cooperation

They concluded that there were probably substantial resources beyond the continental shelf and expressed cautious optimism with respect to future technological achievements. Although they favored international cooperation, they concluded that more detailed study of possible regimes and other types of cooperation would be necessary before making any decisions.

Legal Aspects. A wide range of legal problems were investigated by this group:

- legal status of the sea-bed
- reservation for peaceful purposes
- use of resource in the interests of mankind
- freedom of scientific research and exploration
- exercise of freedoms of the high seas
- pollution and other hazards
- definition of the sea-bed
- moratorium or freezing of national claims

There was no consensus reached on most of these issues. However, it was generally felt that existing international law is inadequate and should be seriously studied. Although there was agreement that exploration should be in the interests of mankind, it was not clear how this might be accomplished.

Other Aspects. Extremely fundamental differences in opinion and perspective were evident in discussions of the military aspects of the sea-bed. It was not possible to differentiate between peaceful and non-military uses, to determine the role which the Eighteen-Nation Disarmament Committee (ENDC) should play, or to decide on the limits of the area of the ocean or ocean floor which the U. N. might reasonably consider in this context.

Several nations felt that precisely defining the limits of national jurisdiction was of central concern. They argued that without resolution of the complex legal issues involved that legal principles applicable to States in the area were premature.

It was suggested that the International Labor Organization and other groups be consulted with respect to the human and social aspects such as conditions of work and protection and training of manpower.

Practical Means to Promote International Cooperation

One way of promoting cooperation is through scientific endeavors such as suggested in a proposal by the Secretary-General and one for an International Decade of Ocean Exploration. These were discussed in an earlier section.

The Ad Hoc Committee also explored possibilities for cooperation in the exploitation of mineral resources. The danger of pollution and other hazardous and harmful effects of exploitation were discussed. The need to insure both the traditional freedoms of the high seas and the freedom of research were stressed. It was also suggested that the 1958 Geneva Convention be carefully reviewed. There was wide disagreement on the nature and even the desirability of suggestions or recommendations to the General Assembly.

Both the U. S. and the U. S. S. R. submitted draft resolutions on limiting the military uses of the sea. The Soviets desire to prohibit the use of the sea-bed for military purposes, and the Americans want to prevent the emplacement of weapons of mass destruction on the sea-bed.

Many delegates agreed that the General Assembly should establish a standing committee to consider the sea-bed issues, but emphasized that it should not replace any of the existing specialized agencies nor duplicate their activities.

Conclusions of Ad Hoc Committee

At the final sessions, members strived to find an acceptable formulation of their conclusions which could obtain unanimous support. Although considerable progress was made, final agreement on all issues could not be obtained. The draft declaration of general principles proposed for submission to the General Assembly and the draft statement of agreed principles proposed for submission are outlined below. The report does not give any indication of how these lists were constructed or which points were unanimously supported. The August-September 1968 edition of the *U. N. Monthly Chronicle* stated that the first list of general principles was submitted by developing countries from Asia, Africa, and Latin America, and the second list of agreed principles was introduced informally by the United Kingdom.

Comparison of the two provides some indication of the support the various issues received. It should be noted that the order and grouping of the principles is different from the report in order to facilitate comparison; there was no indication that the original listings were ordinal. Most of the principles have been paraphrased.

The general principles were:

1. The sea-bed is the common heritage of mankind and no State may claim or exercise sovereignty over any part presently outside the limits of *present* national jurisdiction.

The term "sea-bed" refers to the sea-bed, ocean floor and the subsoil thereof, outside the limits of present national jurisdiction.

2. The exploration, use, and exploitation of the sea-bed shall be exclusively for peaceful purposes.
3. Exploration and use will be carried on in accordance with the U. N. Charter and an international regime should be established to maintain peace and security, to respect territorial integrity and interests of the coastal States, and to promote economic development particularly of the coastal and land-locked developing countries.

The use shall be carried out for the benefit and in the interest of mankind.

The international regime shall consider suitable international machinery to apply the benefits appropriately and equitably for the economic, social, scientific, and technological progress of developing countries.

4. All activities in the sea-bed shall conform to the following guidelines, aimed at protecting the right-ful interest of other States:

- no impediments to navigation, fishing, or the laying and maintenance of cables and pipelines
- coastal States closest to the activities shall be consulted
- must take into account detrimental economic effects on developing countries
- use appropriate safety measures and cooperate in case of mishap
- avoid pollution of waters
- no damage to animal and plant life
- damages caused entail liability

5. The sea-bed shall be open to scientific investigation, without discrimination, and States shall foster international cooperation to allow access and dis-

semination of results, and to provide technical assistance to the developing countries.

6. The United Nations, in cooperation with other groups, shall take adequate measures to ensure the observance of these general principles and guidelines and the implementation of these objectives.

The agreed principles were:

1. There is an area of the sea-bed which lies beyond national jurisdiction (hereinafter described as "this area").

Taking into account relevant dispositions of international law, there should be agreed a precise boundary for this area.

No State may claim or exercise sovereign rights over or appropriate by any means any part of this area.

2. This area shall be reserved exclusively for peaceful purposes.
3. Exploration and use of this area shall be carried on for the benefit and in the interest of all mankind, taking into account the special needs of the developing countries.

There should be agreed, as soon as practicable, an international regime governing the exploitation of resources of this area.

4. Activities in this area shall be conducted in accordance with international law, including the U. N. Charter, and shall not infringe upon the freedoms of the high seas.
5. (No comparable principle).
6. (No comparable principle).

The report stated that elaboration of a set of principles needed further consideration and study, and that to do so at that time would be premature. It did however feel that the progress made would facilitate further agreement by the Assembly.

Resolutions Adopted by the General Assembly

Recommendations of The First Committee (Political and Security)

The General Assembly allocated the item of the sea-bed to the U. N. First Committee for consideration and report. Fol-

lowing meetings in October, November and December, this group recommended that four draft resolutions, 2467 A-D (XXXIII), based on the report of the Ad Hoc Committee and other relevant material be adopted by the General Assembly. They were subsequently adopted in late December 1968.

The first resolution established a permanent Committee on the Peaceful Uses of the Sea-Bed and the Ocean Floor Beyond the Limits of National Jurisdiction composed of forty-two States. The Committee's functions are:

- to study the elaboration of the legal principles and norms which would promote international cooperation in the exploration and use of the sea-bed for the benefit of mankind and in the interests of humanity as a whole
- to study ways and means of promoting exploitation taking into account the foreseeable development of technology and the economic implications.
- to review the studies carried out in the field of exploration and research and stimulate exchange and dissemination of knowledge.
- to examine proposed measures of cooperation to prevent marine pollution.
- to study the reservation of the sea-bed exclusively for peaceful purposes.
- to work in close cooperation with other groups to avoid duplication.
- to make recommendations to the General Assembly.
- to submit reports at each session of the General Assembly.

Although no country voted against this resolution creating a permanent committee, seven countries abstained — Byelorussian SSR, Cambodia, Cuba, Equatorial Guinea, Hungary, Ukrainian SSR, and the USSR. The representative of the Soviet Union explained that the draft did not explicitly include the continental shelf within the limits of the area to be used exclusively for peaceful purposes, and that the USSR was resolutely in favor of prohibiting military use of the sea-bed and ocean floor including the entire continental shelf. He was also concerned that the composition of the committee reflected inadequate representation of the socialist countries. Arguing that issues of war and peace would be discussed, he felt that the membership should be based on political, not arithmetical, grounds, and that at least one additional seat should be granted to a socialist nation. He did state that the committee's work could

be useful it if acted in accordance with the interests of all the States.

The second resolution requested that the Secretary-General, in cooperation with appropriate groups, undertake a study on the dangers of marine pollution to clarify all aspects of protection of living resources of the sea and to consider how to minimize interference among the many means of exploitation. Although this resolution was adopted unanimously, the representative of Guinea said that States of the Third World had some reservations about it. He explained that these Members believed that any convention or treaty should contain strict respect for national legislation. They hoped that the study of pollution would take full note of national legislation and that coastal States would not be excluded from reaping the benefits of the study.

A study was requested in the third resolution on the question of establishing "in due time" appropriate international machinery for the promotion of exploration and exploitation. The resulting report is to be submitted to the new Committee sometime in 1969. On this vote, there were 85 in favor, 9 opposed, and 25 abstentions. Those against the resolution were: Bulgaria, Byelorussian SSR, Czechoslovakia, Hungary, Mongolia, Poland, Romania, Ukrainian SSR, and the USSR. This lack of consensus in the General Assembly was due in part to the stated position of the Soviet delegation that it objected to establishing machinery that would serve only the interests of capitalist, imperialist monopolies.

The fourth resolution welcomed the concept of an International Decade of Ocean Exploration within the framework of programs under the aegis of the U. N. It also requested that the I. O. C. intensify its activities in the scientific field and cooperate with the Secretary-General in the preparation of a comprehensive outline of the scope of the long-term program of oceanographic research. This resolution was adopted by the Assembly without objection.

Recommendations of the Second Committee (Economic and Social)

The Second Committee was requested by the General Assembly to consider the item of resources of the sea. After meeting in October and December, this body recommended two draft resolutions which were adopted by the General Assembly in December.

One of the resolutions, 2413 (XXIII), asked that Member States and U. S. agencies work to increase cooperation and

collaboration in relation to exploiting living marine resources to provide for future food and protein needs, to establishing future measures for fisheries development and conservation, and to providing technical assistance to developing countries. This resolution was adopted by a vote of 99 in favor, none against, and 8 abstentions. The other resolution, 2414 (XXIII), which was adopted without objection recommended that UNESCO consider strengthening marine educational and training programs, that Member States adopt agreements on the prevention and control of pollution, that the Secretary-General consider extending technical assistance and information to States in relation to the development of continental shelf mineral resources, and that the World Meteorological Organization continue its important work.

REPORT OF THE COMMISSION ON MARINE SCIENCE, ENGINEERING AND RESOURCES

Summary

In June 1966, Congress passed the Marine Resources and Engineering Development Act of 1966. In addition to establishing the National Council on Marine Resources and Engineering Development in the Executive Office of the President, it directed the President to establish a Commission which would "make a comprehensive investigation and study of all aspects of marine science in order to recommend an overall plan for an adequate national oceanographic program that will meet the present and future national needs."

The President appointed the fifteen member Commission with Dr. Julius A. Stratton as chairman in January 1967; their report was completed and released in January 1969. The Commission considered the issues within the framework of seven panels: basic science; environmental monitoring and management and development of the coastal zone; manpower, education, and training; industry and private investment; marine engineering and technology; marine resources; and international issues.

The major recommendation of the Commission was the creation of a strong new civil agency with adequate authority and resources to meet the objectives outlined in the report. It suggested that the organization be called the National Oceanic and Atmospheric Agency (NOAA) and begin with an annual budget of about \$800 million which would increase to almost \$2 billion by 1980, resulting in a new \$8 billion program over the next ten years.

There were a wide variety of other recommendations within the areas covered by the panels listed above. Due to time and resource constraints, the capabilities of the U. S. Navy and Merchant Marine were not examined. Regarding international agreements, the Commission did not feel that a single framework for the management of all the uses of the oceans was feasible or desirable in the immediate future. They did, however, recommend that the U. S. take the initiative to propose new international framework for the exploration and exploitation of mineral resources and the conduct of scientific inquiry, and to improve and extend the existing network of international fishing agreements.

The Proposed National Oceanic and Atmospheric Agency

One of the primary responsibilities of NOAA would be to support and increase the nation's capability for ocean research. The Commission did not propose any crash programs but advocated "orderly and evolutionary progress into the sea." Dr. Stratton has pointed out that the situation facing the space

program and NASA differ in several respects with the proposals of the Commission. He hopes that NOAA will not be referred to as a "wet NASA" and suggested that a more suitable analogy would be NASA's predecessor, the National Advisory Committee for Aeronautics. Professor Skolnikoff discusses some of the issues which should be considered when evaluating national organizations for oceanography in *Uses of the Seas* prepared by the American Assembly.

Organization

The new independent operating agency, which would report directly to the President, would absorb a large portion of the non-military marine programs presently being conducted by various federal agencies and departments. The initial composition would include:

- the U. S. Coast Guard of the Transportation Department
- the Bureau of Commercial Fisheries of the Interior Department
- the marine and anadromous fisheries functions of the Bureau of Sport Fisheries and Wildlife of the Interior Department
- the National Sea Grant Program now administered by the NSF
- the U. S. Lake Survey of the Army Corps of Engineers
- the National Oceanographic Data Center
- the Environmental Science Services Administration of the Commerce Department which is composed of the Weather Bureau and Coast and Geodetic Survey, along with the environmental agencies

This would provide NOAA with about 320 seagoing ships and 55,000 employees (mostly in the Coast Guard). It would have thirteen physical environmental science laboratories, fifteen marine biology laboratories, six technology laboratories, and five coastal laboratories. The agency might also include other agencies which are concerned with marine affairs, such as the National Center for Atmospheric Research now operated for NSF.

NOAA, however, would remain separate from the work done by the Navy and the Maritime Administration. Also where functions of programs are essential to the operation of existing groups they will not be consolidated, e.g., the oceanography-from-space program of NASA and the marine-related nuclear energy programs of the Atomic Energy Commission. It is possible that there will be cooperation with these groups in some aspects of research and technology.

Creation of a National Advisory Committee for the Oceans (NACO) is requested to advise the head of NOAA and report to the President and Congress on the progress of ocean programs. The members (about 15) would be appointed by the

President from the broad marine community. This group would also attempt to bring elements of the regions, universities, and private industry into a more cohesive and effective group.

Functions

Some of the functions envisioned for this new organization are:

- to explore the marine frontier and its interrelationships with the atmosphere
- to consolidate the present government efforts for better efficiency
- to establish national projects focused on specific areas of need
- to expand capabilities in marine research and technology
- to stimulate development of basic marine technology and engineering
- to create incentives for private investment in marine resource development and exploitation
- to establish a national project of test facilities for under-sea systems
- to support "effective" state management of coastal zone activities
- to conduct preinvestment surveys to determine offshore mineral potentials
- to minimize conflicts over uses of the marine environment

Finances

The \$8 billion requested for the next decade of ocean research represents entirely new programs. It is in addition to the \$500 million plus spent annually on civilian marine and atmospheric programs and \$300 million to support military work in ocean research. NOAA would begin with a budget of about \$800 million dollars consisting of old and new civilian programs and would increase to \$2 billion by 1980, approximately \$1 billion over and above current program levels. Although rapid early growth is expected with a levelling off as the current backlog of unmet needs are met, the doubling of present efforts represents a straight line growth rate of 7 to 10% per year. This estimate includes expansion of old programs at an arbitrary 7% growth rate. It was suggested that some current expenditures might be more profitably redirected to support new programs.

The Commission stressed that the intangible returns of a livable environment and of security as well as the important and relatively quick economic and technical returns should be taken into account when considering the costs of these programs.

Reception

The future of the NOAA proposal and the other recommendations of the report depend on the reception they receive from the President, Congress, the affected departments and agencies, and the scientific and technical community. The proposed expenditure, which is about one-third of the sum spent during the 1960's on the Apollo manned lunar landing program, comes at a time the Congress is trying to pare the national budget, not expand it. The Commission noted that the question of priorities was not within their charter and did not discuss the marine exploration programs in relation to other federal endeavors. They also did not rank their various marine proposals. Unless the Congress is willing to accept the "package" or rejects it out of hand, these difficult issues will have to be faced.

In anticipation of the report's recommendation for NOAA and of adverse reaction, Representative Charles A. Mosher (R-Ohio), one of the congressional advisers for the Commission, consulted with President-elect Nixon. In December, the President-elect released a letter to Dr. Edward Wenk, Jr., executive secretary of the Marine Council, in which he said that his administration would give a high priority to an "integrated program" in oceanography. After delivering the Commission report to Nixon forces in early January, Rep. Mosher stated that he believes that the President puts a "very high priority on the need for a vigorous program" in the oceans.

The attempt to construct NOAA with parts of existing departments may meet tremendous resistance from federal bureaucrats. Three Departments — Transportation, Interior, and Commerce — are directly affected and may not willingly give up sections of their domain of responsibility. Insight into what may be in store might be provided from a *New York Times* article on October 27, 1968, which observed that the Interior Department was beginning interlocking its various marine resources activities in an apparent attempt to defend its stewardship of U. S. ocean riches when the issue comes before Congress. Responsibility for coordination of the department's programs was placed with an Assistant Secretary and a new office of marine resources was created.

Congressional committee structure may result in two problems. Some of the bureaucracies have close ties with their authorization committees in Congress. When shifts begin to deprive some of these congressmen of some jurisdictional authority, they may resist. The other problem concerns future committee arrangements. The report states that NOAA can be successful only if adjustments are made and urges that a single legislative and appropriations committee in each house have sole responsibility. It noted that ESSA has had to report to three separate House legislative committees which complicated development of a balanced program. Since such regrouping

would alter existing arrangements and structures, some congressmen may oppose these moves.

Recommendations on International Agreements

International Fisheries Management

Improving and extending the existing international arrangements appeared to the Commission to be the best way to obtain U. S. objectives regarding the living resources of the high seas. Issues which should be concentrated on include catch quotas, relations with coastal nations particularly Latin America where they are strained, determination of the breadth of territorial waters, and conservation regulation and conventions.

The Continental Shelf

The Commission recommended that the U. S. take the initiative to secure international agreement on a redefinition of the "continental shelf." It noted that the present legal definition is ambiguous and does not correspond to its geological definition. The resulting uncertainties will deter private enterprise from exploring and exploiting the resources of the seas. After considering numerous redefinitions, it suggested a "narrow" shelf with precise outer limits. The seaward limit would be fixed at the 200-meter isobath (the average depth of the world's shelves) or 50 nautical miles (the average width) whichever gives the greater area. For adjacent nations, "median-line" principles of the 1958 Convention on the Continental Shelf would apply. In order to prevent future problems, they suggest that bathymetric surveys be conducted to translate the depths into geographical coordinates which would not be subject to change because of alterations in the coastline or new information.

The report specifically treated the position of the National Petroleum Council (NPC) and concluded that it was unwarranted by present legal language or history and was contrary to the best interests of the United States.* The Commission stressed that fixing the outer limits of the shelf is inseparable from that of the international framework applicable beyond the limits. Four areas other than the continental shelf which must be treated are the internal waters and territorial sea of a nation, the contiguous zone, the high seas, and the bed and subsoil of the deep seas.

*The Interim Report of the National Petroleum Council's (NPC) Committee on Petroleum Resources Under the Ocean Floor was adopted by the NPC on July 9, 1968. It maintains that coastal nations have "sovereign rights" over the natural resources of the continental land mass seaward to where the submerged portion meets the abyssal ocean floor. This includes the natural resources of the geological continental shelves, continental borderlands, continental slopes, and at least the landward portions of the geological continental rise. Where the continent drops off sharply near the coastline, it would add to the legal "continental shelf" an area of contiguous ocean floor. The report proposed that the U. S. declare the intention of exercising sovereign rights and invite all other coastal nations to do likewise. Further dealings would thus be with coastal nations rather than the international community.

New International Framework

After enumerating a number of objectives which a framework should meet, the report concluded that the present system was not acceptable. New principles, rules, procedures, and institutions are required for the exploration and exploitation of the mineral resources of the sea and for the conduct of scientific inquiry. The Commission urged that the U. S. "seize the opportunity for leadership" and make substantive proposals.

Mineral Resources. A series of provisions were recommended for new international agreements. Their interrelation was stressed and it was advised that they be considered only as a whole. The provisions were:

- an International Authority to register national claims beyond the redefined continental shelf
- an International Fund of money collected from registered exploiting nations to aid marine activity and developing countries
- registered nations would have certain powers and duties
- dispute settlement provisions
- creation of an intermediate zone extending to the 2,500-meter isobath or 100 nautical miles, whichever yields the greater area, in which only coastal nations or its licensees could explore or exploit

In the years which it would take to develop a new framework, the Commission suggested that the nations agree on a set of principles consistent with the proposed provisions. It supported the principles which the United States proposed for adoption by the U. N. General Assembly. The principles listed below resemble in several important respects those agreed on by U. N. Ad Hoc Committee on the Sea-Bed which were described earlier:

- redefinition of the outer limits of the continental shelf
- no claim or exercise of sovereignty or sovereign rights beyond the new limits
- dedicate a feasible and practical portion of resources to international community purposes
- exploitation prior to redefinition shall not prejudice the boundary's location

In addition, the Commission recommended that the U. S. propose that no nation, in the interim, claim sovereignty over any part of the sea-bed or subsoil beyond the 200-meter isobath.

The report stated that the U. S. should continue authorizing exploration and exploitation beyond the 200-meter isobath but with the understanding it would be subject to any future international agreements. In order to protect private enterprise, it urged Congress to enact legislation to compensate for any losses which might occur as a result of a future framework.

Oceanic and Atmospheric Monitoring. Although the present governmental and nongovernmental international organizations have served well in facilitating collaboration on marine science problems, the pace of research and exploration is steadily increasing. It was concluded that an intergovernmental organization dealing with ocean matters would ultimately have to be established by treaty and given adequate authority, personnel, and financial resources. The Commission was unable to determine whether it would be better to establish an additional body by raising the Intergovernmental Oceanographic Commission (IOC) to the status of a specialized agency or to form a new body incorporating the functions of existing bodies. It did, however, suggest that formation of NOAA would lend impetus to the latter solution.

Marine Research. Within the existing international framework, it is very difficult to conduct marine research programs on the global basis which many require. The necessity of dealing with coastal nations because of restrictions in the exclusive fisheries zone and the requirements of the Convention of the Continental Shelf greatly retards scientific investigations.

The Commission recommended that the U. S. take the initiative in proposing a new convention embodying the following provisions:

- scientific research can be conducted in any territorial waters and on the continental shelf without prior consent provided that notification is given in sufficient time to allow the coastal nation to decide if it wants to participate, and provided that the results are published
- fisheries research may be conducted in any exclusive fisheries zone under the conditions listed above
- research submersibles may be used in any territorial waters even if they do not navigate on the surface provided that the coastal nation is notified in enough time to assure safety of navigation
- research buoys may be placed in any territorial waters and shall be protected against unwarranted interference if they meet reasonable requirements specified by the coastal nations

In the interim, the report proposed that the U. S. seek to enter into bilateral and regional agreements embodying the above recommendations and take other initiatives to encourage freedom of scientific research and international scientific cooperation.

Additional Commission Recommendations

Science and Technology

The Commission noted that there were no strong civil marine technology programs as there are for marine science, and suggested that inadequate technology was limiting "big

science." Therefore, their program placed heavy emphasis on technology — both fundamental and specific. Some scientists have observed that the role of science, particularly biology and chemistry, was slighted.

Laboratories

The report pointed out that the nation's marine science program must be built around institutions such as Woods Hole Oceanographic Institution, Scripps Institution of Oceanography, and the Lamont Doherty Geological Observatory. It also recommended that "coastal zone laboratories" be established in connection with academic institutions to engage in scientific investigation of estuarine and coastal-zone processes.

The Commission suggested that a small group of laboratories, including present leaders in ocean research, be designated by the government as "University-National laboratories" and equipped for major global or regional scientific tasks. These labs would be geographically distributed and would be open to scientists from other institutions. This approach appeared to be more economical than attacking major projects on a project-by-project and facility-by-facility basis. The labs would also continue to seek funds for specific projects from other federal agencies or private sources such as the NSF and the Office of Naval Research.

With regard to use of the continental shelf, the report suggested the construction of laboratories on the shelf bottom in areas of high concentration of mineral and biological resources. These centers would have living and working quarters for 15 to 150 men and would receive logistic support through various methods. Another proposal was made to build an experimental nuclear power plant to be placed on the shelf to determine if such plants can be moved away from shorelines and heavily used waterways.

Exploration and Exploitation

Two suggested goals for marine technology and engineering were to make it possible for man to work on the ocean floor for long periods at depths to 2000 feet — the most productive region of the sea, and to develop the capability to explore by other means depths to 20,000 feet by 1980 and to be able to utilize them by the year 2000. This depth takes in about 98% of the ocean floor.

According to the report only one-sixth of the world's petroleum comes from the continental shelf areas now but the proportion is expected to be one-third by 1980. Urging the U. S. government to prepare for this, the Commission called for improvement of leasing and regulatory policies for offshore oil drilling. Possibilities include longer advance warning of oil-lease sales, abandonment of competitive bidding in deep-sea

sites, and review of rate-selling and tax write-off rules to encourage gas and oil pipelines to run further offshore.

Other Recommendations

Some of the additional recommendations made by the Commission were:

- restoration feasibility test for the Great Lakes
- development of a pilot buoy network using advanced techniques
- stronger enforcement of pollution abatement measures and a wide-ranging attack on pollution
- creation of a single comprehensive National Environmental Monitoring and Prediction System (NEMPS) by integrating several existing systems
- more research in the area of aquaculture
- “timely” exchange of scientific and technical information among the government, industry and the scientific community
- involvement of private industry in planning and conducting national projects
- simplify and clarify policies and laws affecting business and publicize them
- provide flexibility to develop hard minerals on the outer continental shelf without competitive bidding through the Interior Department
- arrange with NASA for satellite oceanographic sensor development and operation
- amendment of the Sea Grant Act of 1966 to permit grants for the construction and maintenance of vessels and other facilities
- improving fisheries estimates and cooperation with other nations
- removal of restrictions on use of foreign-built fishing vessels

POLLUTION OF THE SEA

The United Nations

Background

In 1954, an international conference was held to consider the problem of oil pollution in the oceans and an International Convention for the Prevention of Pollution of the Sea by Oil was established. This was amended in 1962 to enlarge the zones in which discharge of persistent oils are prohibited and to restrict completely discharge from certain types of ships. The prohibited zones now include all sea areas within fifty miles from land, and extend even closer near some coasts. This Convention is administered through the cooperative machinery of the Inter-Governmental Maritime Consultative Organization (IMCO), and is presently the only existing international instrument exclusively addressed to the prevention and control of pollution of the sea. There are thirty-seven countries, including all of the major maritime nations, which have accepted the Convention. These nations cooperate on the legal, navigational, and technical aspects to allow rapid and effective measures to be taken when major accidental spillage occurs.

Until the mid-1960's, international attention was focused on efforts to prevent pollution by oil and radioactive substances. However, the growing danger to fisheries as a result of chemical pollution and the dumping of industrial wastes into the sea which could no longer be discharged inland became increasingly evident. The Food and Agriculture Organization (FAO) of the U. N. established an inter-governmental Committee on Fisheries (COFI) which has directed its attention to the broad fishery aspects of marine pollution for the past two years.

Several studies have been undertaken including those by the Advisory Committee on Marine Resources Research (ACMRR), the Scientific Committee on Ocean Research (SCOR), and the Inter-governmental Oceanographic Commission (IOC). These have helped to clarify the requirements for further international action with respect to research, monitoring, and future legislation.

Recent Developments

General. In April 1968, the Secretary-General treated the scientific and technical aspects of pollution as urgent problems in his report prepared under Resolution 2172 (XXI), and pointed out that a high degree of satisfactory concerted action was being attained through existing machinery. The Administrative Committee on Coordination (ACC) through its Subcommittee on Marine Science and its Applications has played a key role in gathering information and suggestions on which a realistic expanded and coordinated program can be based. Groups within the U. N. which have been primarily concerned with these problems include IMCO, FAO, UNESCO, the Inter-

national Atomic Energy Agency (IAEA), and the World Health Organization (WHO).

Future action will cover the joint provision of scientific and technical advice, exchange, and dissemination of information and development of future international legislation for the control of pollution. All aspects of marine pollution will be covered — health, fisheries, oily and radioactive substances, other pollutants, pertinent marine research, control, and monitoring.

The Secretary-General proposed that the General Assembly urged continued action by U. N. agencies on the problems of marine pollution, and urge all Member States to cooperate with the organizations and take steps toward adopting effective new international agreements to prevent and control pollution. He noted that new programs would require the establishment of a Joint Group of Experts on the Scientific Aspects of Marine Pollution by FAO, IOC, and IMCO as well as other agencies that might wish to join in. This group met for the first time in January, 1969.

There is a great deal of present and future activity planned in this area by the United Nations. The FAO is developing an active program which will include the convening in 1970 of a Technical Conference on Marine Pollution and its Effects on Fishery Resources and Fishing. There is coverage of pollution problems in the United States proposal for an International Decade of Ocean Exploration (IDOE). The International Biological Program (IBP) launched by the International Council of Scientific Unions (ICSU) is concerned with man's effects on the biological productivity of his environment and specific programs include many studies of pollution problems. The International Union for the Conservation of Nature and Natural Resources (IUCN) is becoming interested in marine pollution, and the International Association for Water Pollution Research (IAWPR) has broadened its activities from primary concern with inland water pollution.

New Pollution Conventions. In the report discussed above, the Secretary-General explicitly suggested that pollution agreements be adopted in addition to the Convention for the Pollution of the Sea by Oil of 1954. As a result of the TORREY CANYON disaster, IMCO has extended the terms of reference under the Convention of its relevant study groups to "other noxious substances" than oil in connection with accidents at sea involving bulk carriers. It has been recently suggested by Roy I. Jackson, Assistant Director-General (Fisheries) of the FAO that broadening of the 1954 Convention to control all types of discharges from ships might not be the most practicable solution to the problem of pollution control. The most effective approach might be establishing a series of regional sea-area agreements such as the International Council for the Ex-

ploration of the Sea (ICES) is considering for the North Sea and adjacent areas. These agreements might also make it possible to deal with discharges in national waters which eventually pollute international waters. Mr. Jackson has noted that several questions will require further examination: the question of discharges on the high seas from structures other than ships; the status of waste outfalls running from land through territorial seas into the high seas or onto the continental shelf; the problems of pollution of waters outside of national jurisdiction but over the continental shelf and the effects of this on the sedentary resources which may be under national jurisdiction.

Oil Pollution. An International Conference on the Old Pollution of the Sea was held in Rome in October, 1968. A number of papers were presented and many issues were discussed. The 34 countries and 22 international organizations which were represented unanimously adopted the following resolutions:

- urges further adoption of the “Clean Seas Code” of procedures for cleaning oil tankers
- recommends IMCO to pursue efforts to secure universal adoption of separation of traffic schemes
- recommends intensified research into the biological effects of pollution
- recommends more cooperation in the Mediterranean to reduce dangers caused by accidents to tankers
- requests IMCO to pursue consideration of rights and obligations of States with regard to pollution occurring in international waters
- suggests IMCO call another international conference to consider the amended 1954 Convention in the light of new knowledge and experience
- urges governments to realize the threat of pollutants other than oil
- expresses hope that national groups will be formed where they do not already exist to consider the effects of pollution

Radioactive Pollutants. The International Laboratory of Marine Radioactivity in Monaco was established in 1961 as a cooperative venture between the International Atomic Energy Agency (IAEA), the Monegasque Government, and the Oceanographic Institute in Monaco to perform joint research on the effects of radioactivity in the sea. Over the years the program has been reoriented to place more emphasis on standardization and coordination of methods and techniques and less emphasis on basic and scientific studies with respect to the subject of marine releases of waste.

A new six-year program was authorized in June 1968 to study on an international scale the health and safety aspects of the radioactive pollution of the sea. The Laboratory will develop reference analytical methods and techniques for investigating the effects of radioactivity on marine biota. It will also promote their adoption by national and international institutions that are studying these effects and the behavior of radionuclides in the marine environment in order to ensure the comparability of the results obtained. The program is also concerned with developing and recommending technical measures that should be taken in the event of accidental radioactive contamination of the sea and will assist Member States with regard to marine radioactivity problems.

The United States

Pollution Contingency Plan. Following the TORREY CANYON accident, the President directed the Departments of Transportation and Interior to prepare recommendations for a national program to deal with the hazards of oil spill from ocean-going transportation. These recommendations concerning policies, procedures, and programs to prevent disasters from hazardous cargoes and to mitigate the damage in case of accident were submitted early in 1968. The Secretary of the Interior then assumed primary responsibility for preparing a multi-agency contingency plan for response to emergencies.

The resulting *National Multi-Agency Oil and Hazardous Materials Pollution Contingency Plan* was approved by the President in the fall of 1968 and established a pattern for a coordinated response among the Departments of the Interior, Transportation, Defense, and Health, Education and Welfare, and the Office of Emergency Planning. In addition to creating a national reaction team, the Plan provides guidelines for the establishment of regional contingency plans and reaction teams and encourages the development of local government and private capabilities to handle pollution incidents. It also incorporates procedures to utilize the prediction services of ESSA on information related to tides, winds, river flow, and sea states that can affect dispersion of oil and other pollutants.

Research and Development. Several agencies have planned extensive R & D programs in strengthening the capability to detect, contain, and ameliorate spills of oil and other hazardous cargoes. In FY 1970, the Federal Water Pollution Control Administration (FWPCA) proposes a funding level of \$1.7 million and the Coast Guard proposes \$2.6 million for these activities. The Corps of Engineers will also participate in this

work. To supplement efforts on corrective aspects, the Coast Guard has initiated a program of research and regulatory action to prevent pollution by ship cargoes. The behavior of chemicals in the marine environment will be emphasized because of the present lack of knowledge about their great potential hazard. The National Academy of Sciences Committee on Oceanography and the National Academy of Engineering Committee on Ocean Engineering plan to hold a workshop in late Spring 1969 to discuss the problems which the FWPCA has with the disposal of wastes in the coastal environment.

Oil Well Leaks. As of this writing, the most spectacular ocean pollution incident during the past year occurred from oil well leaks six miles off the shores of Santa Barbara, California. Beginning on January 28, 1969, several fissures in the ocean floor leaked about 230,000 gallons of oil which spread over 800 square miles of ocean before the well was successfully sealed 12 days later. Some estimates of damage range up to \$1 billion, with no way of determining the short- and long-term effects on the ecology of the coastal waters. Local citizens and officials, especially those who own the \$5 million worth of boats smeared by the oil and the beach-front property which was valued as high as \$2,000 a front foot, are demanding and getting response with respect to stronger federal regulations governing the drilling of oil wells on federal tidelands.

Secretary of Interior Hickel inspected the site during the leaks and ordered all oil companies in the area to suspend operations until the drilling plans of the companies could be reviewed. Twenty-four hours later he allowed drilling to resume; the resulting protests prompted a re-reversal two days later and the rigs were ordered to close down again.

On February 4, Secretary Hickel announced that his Department would undertake a full-scale investigation of existing regulations covering offshore drilling. President Nixon directed his science advisor on February 11 to set up a panel of scientists and engineers to find ways to prevent future oil pollution. In late February, upon the recommendations of the scientific panel, temporary pumping from wells in the Channel was ordered to relieve pressure in an existing seep.

One of the heated controversies during the Santa Barbara crisis was centered around the use of the dispersant used to try to break up the oil slick. The Union Oil Company began spraying the oil with Corexit, a chemical developed by Esso Research and Engineering Company, claiming that it is harmless to marine plant and animal life. After four days, the Federal Water Pollution Control Board ordered spraying stopped but

later allowed it to resume. This was not a detergent such as those used for the TORREY CANYON accident which many claim did more harm to marine life than the oil did. There are however serious questions regarding the effects of Corexit and similar chemicals on marine life and further research is certainly in order.

The pending sale of 27 offshore leases on the outer continental shelf off the Louisiana Coast has been postponed. A moratorium on sales of Federal offshore oil and gas leases is to be maintained until the Department of Interior is assured that regulations exist which will prevent pollution such as occurred at Santa Barbara. In mid-March another oil well, this time in the Gulf of Mexico off of Louisiana, began pouring oil into the ocean. Because of favorable tide and wind conditions no coastal damage resulted from that incident.

Congressional Hearings. As oil continued to spew into the waters off of the coast of Santa Barbara, hearings on two water pollution bills (S. 7 and S. 544) began in a Senate subcommittee on February 3, 1969. The bills, similar to one which barely failed to pass in 1968 after a strong lobbying effort by oil and public power interests, deal with sewage discharges from vessels, oil pollution control, compliance with water pollution standards by federal licenses, and various research authorizations. They contain the controversial provisions of the 1968 bill (S. 3206) which would extend oil pollution controls to offshore drilling installations and would give the Secretary of the Interior increased powers to control interstate water pollution by licensees of federal agencies. Senator Muskie introduced the two bills and chairs the Subcommittee.

Representatives of the oil and shipping industries and other spokesmen have argued that the proposed maximum liability of \$15 million or \$450 per gross ton, whichever is the lesser, for clean-up costs is beyond the capacity of the world insurance markets, and they suggest instead a ceiling of \$10 million or \$100 per gross ton. Appearing before the Subcommittee on February 28, Secretary Hickel not only supported the bills but suggested that they be strengthened in several major respects. His proposals included:

- safeguards against any potential pollutant, not oil alone
- eliminating the \$15 million liability for well blowout and placing unlimited liability on the companies
- provision for civil penalty for willful or negligent discharge of pollutants for offshore oil operations, not only for ships

- placing the burden of proving lack of negligence on the owners and operators of wells and ships
- creation of a revolving fund in the Treasury for financing cleanup operations
- requirement of proof of financial ability to pay for clean-up by ships using navigable waters

It is highly probable that the public outrage, the report of the President's panel, the studies of the Interior Department, and the Congressional hearings will result in changes in present federal regulations of off-shore drilling and shipping practices, though there will of course continue to be strong counter-pressure from industry lobbies. It should be remembered, however, that bills such as those introduced by Senator Muskie can only pertain to shipping practices and spills which occur within the territorial waters of the United States — a limit of three miles. For protection from and control of pollution to our coast from foreign vessels on the high seas, international agreements must be established.

PROGRAMS OF THE U. S. NAVY

A recent compilation of naval activities in this area can be found in the January 1969 report of the National Council on Marine Resources and Engineering Development, *Marine Science Affairs — A Year of Broadened Participation*. Military marine science programs are primarily directed toward increasing the Navy's ability to perform its functions in maintaining the national security of this country. They concentrate on strategic deterrence; anti-submarine operations; support of amphibious operation, mine warfare, and limited ground action; surveillance of the oceans; and operations to maintain and protect essential shipping.

In the course of these programs, much knowledge is gained which is made available in unclassified form for general use. This contribution to scientific, public, and private interests constitutes a large portion of the U. S. oceanography program. During this past year, a considerable amount of bathymetric data which had been derived from both conventional and highly precise navigational positioning were declassified. Information on the latest ship design and materials development has been provided for use by private industry and Federal maritime agencies, and many developments in navigation, ranging from submerged vehicle to satellite detection, have been released for scientific and commercial use. Information about the earth's crust and about characteristics relevant to earthquake studies and volcanology has been provided by D. O. D. sponsoring programs. The work of civilian agencies is also used to help the Navy which employs the nautical charts developed by ESSA and the ESSA and Coast Guard surveys.

The Naval Oceanographic Program is divided into three programs which strive for a better understanding of the oceans and the techniques required for their exploration. The Ocean Science Program is concerned with the study of the physical, chemical, biological, and geological characteristics of the oceans. The Ocean Engineering and Development Program is responsible for undersea search, rescue, salvage, and construction. The Oceanographic Operations Program collects environment data with a variety of specially designed devices.

The Navy sponsors over one-half of the Federal marine science program. About 27% of the total marine science budget will be the \$143 million which is proposed for the exclusively marine science components of the military program in FY 1970. Other Navy programs also help the national marine science program by approximately that same amount. The proposed budget is 12% higher than that for FY 1969 and reflects increased support of fleet operations and priority developments in the areas of military ocean engineering discussed below.

Ocean surveys are conducted to obtain comprehensive oceanographic, hydrographic, and acoustical information about ocean areas of the world in which our Navy operates. In order to collect that data there are fifteen Navy surface ships and four airplanes assigned full time in addition to other ships used on an opportunity basis. In FY 1968, these surveys acquired vast quantities of precise environmental data over millions of square miles of the North Atlantic and North Pacific Oceans and the Mediterranean Sea. This year projects will include: anti-submarine warfare surveys in the North Pacific, Gulf of Mexico, and North Atlantic; mine warfare surveys in the western Pacific and Mediterranean; and aircraft ice surveys in the Arctic.

There are a number of marine science and technology activities which are directed toward exploratory and advanced development in underwater sound propagation to support sonar design and surveillance systems. The comprehensive program of investigations consists of twenty-six projects at eighteen Federal and non-Federal laboratories, including ten private corporations.

The programs to develop undersea search, rescue, recovery, and man-in-the-sea capabilities are extremely important as was emphasized in 1968 by the loss of the *Scorpion* and of a French and an Israeli submarine. There are a number of programs and projects designed to explore specific aspects of these advanced ocean technologies. They include the Deep Submergence Systems Project; the Submarine Location, Escape, and Rescue Program; the Small Object Location and Recovery Project; and the Man-in-the-Sea Project. This latter effort includes Sealab III presently being tested near San Clemente Island off the California Coast. The Navy is also constructing a nuclear powered research and ocean engineering submersible (NR-1). Sea trials and initial operations are scheduled for early 1969.

In a joint Navy-Duke University advanced biomedical project in December 1968, divers participated in a saturation dive at a simulation depth of 1,000 feet for 77 hours and 30 minutes. Observations indicated that the divers can perform well under these conditions. The extensive physiological data obtained from the experiment will be published in the near future. Several other research programs in biomedical science have been scheduled for this year.

The Advanced Research Projects Agency (ARPA) has conducted the VELA project for a number of years. The R & D work on detecting, locating, and identifying nuclear explosions in the ocean has been successful, and that part of VELA is being phased out. Other parts of the project which will be continued include seismic calibration experiments intended to provide information on the earth's crust and upper mantle.

It is clear that the Navy is responsible for a large portion of the Nation's present oceanography program. Because it is also responsible for the national security with respect to the oceans, it will probably not discontinue its work even if a civilian agency is established. It will also continue to insist upon substantial freedom in its exploration of international waters. Therefore, the Navy's interests cannot be disregarded in the determination of either domestic policies for ocean exploration and exploitation or of international policies regarding a regime for the ocean floor which will certainly have to involve the ocean space above the floor in some manner. As indicated elsewhere in this report, the Navy is quite concerned about the restrictions on the movements of military vessels which might result from internationalization and licensing of the sea-bed.

The United States appears to be making a distinction in the United Nations between civilian and military considerations as it attempts to relegate the military questions to the Eighteen-Nation Disarmament Committee. This same type of separation is evident in the Report of the Commission of Marine Science, Engineering, and Resources. Although it might be possible to treat both aspects in parallel, there are serious problems in this type of approach. Several countries, and perhaps some groups in the U. S., feel that the two considerations are inseparable and it would be neither advisable nor desirable to treat them otherwise.

There is a further problem in the distinction between peaceful, non-peaceful, and military uses of the sea and the sea-bed. In endorsing peaceful uses only, it is not clear what is being precluded. If the Navy's programs are to be considered by definition the antithesis of peaceful uses, then the U. S. will have great difficulty implementing its avowed desire for exclusively peaceful exploration of the ocean floor. If on the other hand, the more realistic position is taken that certain military programs can be peaceful, it will be necessary to set about the task of determining where the lines are to be drawn.

ADDITIONAL DEVELOPMENTS IN 1968 AND 1969

Support of U. S. Oceanography Programs

Two Senate proposals were made in the first half of 1968 to reinvest a portion of government revenues from marine oil operations into oceanographic research. The plan suggested by Senator Warren Magnuson would make \$25 million of revenues available for marine exploration and mapping. Senator Russell Long's even more ambitious plan would earmark 52½% of the revenues from off-shore oil and gas leases for marine science research. These revenues currently total more than \$1 billion annually.

A report prepared by the National Planning Association under contract with the Marine Council and NSF was published in May 1968. It examined over fifty measures that the federal government might take to stimulate private investment in marine resource development and concluded that "there is no dearth of measures" for achieving this objective.

International Decade of Ocean Exploration

President Johnson proposed the IDOE program in March 1968. It would dedicate the next decade to intensified and sustained international collaboration to plan, develop, and implement programs for exploring the world's oceans. In December 1968, the General Assembly of the U. N. welcomed the concept within the long-term program of research and exploration under the aegis of the United Nations. It has been estimated that the cost will be \$8 - 10 billion, with a U. S. contribution of about \$3 billion.

The National Academy of Sciences and the National Academy of Engineering have been contracted to study the scientific and engineering goals and priorities and to provide advice for the IDOE. The joint NAS-NAE study is expected to be completed by mid 1969.

Educational Programs

The Sea-Grant Program of NSF began in fiscal year 1968 with a \$5 million dollar budget. Six institutional programs were initiated, as were smaller grants for two other major institutions for planning activities, eight grants for educational projects, eight for research projects, and five for study and planning projects. NSF's request for FY 69 was \$15 million, but the Bureau of the Budget imposed a \$6 million ceiling. In August 1968, a compromise bill was signed which authorized a 2-year extension of the program, a budget of \$6 million for FY 69, and \$15 million for FY 70. These measures will have serious effects on the impact of the program for the near future.

There have been commitments to oceanography curricula and expansions of existing programs in several universities. Some of these are:

- establishment of a joint doctoral program between Massachusetts Institute of Technology and the Woods Hole Oceanographic Institution.
- plans by the University of Texas' Marine Science Institute for a four- to six-fold increase in faculty, graduate students, and research facilities over the next decade
- commitment by the University of Maine to a \$7.4 million master plan through 1968 to develop its oceanography program
- a five-year plan by the University of Delaware for growth of an ocean engineering program and plans for greatly increasing the capabilities of its existing marine labs
- plans of the American Association of Junior Colleges for training marine technicians

Dr. William G. Torpey of the Office of Emergency Planning in the Executive Office of the President suggested in January 1969 that future needs for marine manpower might be met from a relatively untapped source. He pointed out the desirability of government and college cooperation in training disadvantaged youths of any race with a bent for science for the scientific and technical personnel needs of future marine science.

Proposed Council of Maritime States

Representatives of 18 states, Puerto Rico, and the Virgin Islands attended a conference in Florida in November 1968 to discuss the role of the states in future national oceanic efforts. The delegates, numbering over one hundred, drafted a resolution to President-elect Nixon expressing concern over and interest in the national programs. They also sent a report to the Governors of the maritime states which stated recognition of both federal responsibility for total national interest and individual maritime states' responsibilities for the development, regulation, and management of coastal resources. It urged coordination of state and federal activities, and recommended the creation of a "Council of Maritime States, Commonwealths, and Territories." Another meeting will be held sometime in 1969.

Great Lakes Study

The National Marine Council announced in August 1968 that it had contracted with the National Planning Association to conduct a study of the use and management of the coastal and water resources of Lakes Erie and Superior. The study will be completed in 1969.

U. S. Research Halted by Brazil

The Brazilian government, fearing foreign exploitation of its resources, has refused the University of Miami access to the

waters within 200 miles of its broad coastline. The Miami group is making a thorough ecological examination of the submarine flora and fauna of the tropical Atlantic. After a series of negotiations, temporary agreements, and dramatic reversals, the research program finally left Brazilian waters in late August 1968, probably forever. This is an example of the strained relations which the Marine Sciences Commission referred to in its report.

Oceanography in Other Countries

Surveys of marine science activities of 99 nations were published in April 1968 by the National Council on Marine Resources and Engineering Development. The contents include a brief description of the activities' economic importance, means for coordination of ocean endeavors, and the nature and scope of the marine research.

Proposed Oil Supertanker Ports in New England

The Occidental Petroleum Company has proposed to build an oil refinery in Machiasport, Maine, which would be supplied by supertankers with capacities up to 340,000 tons. This site has been chosen because of the deep water around several small offshore islands where the oil will be off-loaded. The construction of the 300,000 barrel/day refinery, which would take about 18 months, will not begin until two important legal matters have been settled. The Department of Commerce must determine if a free trade zone for foreign crude oil will be allowed, and the Department of Interior must rule on the status of refined oil with respect to import into the United States. There has been some local concern about industrialization in the area and air pollution. This arrangement also poses a potential oil pollution threat. A major spill or an accidental grounding in the strong tides of the area could have serious consequences. The TORREY CANYON which ran aground off the Cornish coast in 1967 was only a 120,000-ton tanker.

Portland, Maine, has also been cited as a location where supertankers might be accommodated along the New England coast. In April 1969, King Resources Company announced plans for docking, pumping, and storage facilities on Casco Bay's Long Island. After some dredging it will be possible for the supertankers to approach close enough to allow their cargo to be pumped out through an underwater pipeline to storage tanks on the island. Initially, underground tanks built by the Navy in World War II will be used. There is a possibility that more tanks and perhaps even a refinery will be built at a later date. Some of the oil will be reshipped in smaller tankers to other ports which cannot handle supertankers; some will go into the Portland-Montreal pipeline; and some may be used in the area. Oil spills should be relatively easy to control in the slow current of the Sound and a study of booms and air-screens is in progress.

